**Bellwork: 3/21/13**

**Multiply and Simplify the rational expressions below:**

$$\frac{2x^2-5x-12}{x^2+2x-24} \cdot \frac{x^2-36}{4x+6}$$

$$\frac{(2x+3)(x-4)}{(x+6)(x-4)} \cdot \frac{(x+6)(x-6)}{2(2x+3)}$$

$$\frac{x-6}{2}$$

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3) $\frac{3x^2-15x}{x^2-25} \cdot \frac{2x+10}{18x}$

$$\frac{3x(x-5)}{(x-5)(x+5)} \cdot \frac{12(x+5)}{18x} = \frac{1}{3}$$

$36$

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6) $\frac{x^2-2x+1}{7x-7} \cdot \frac{21}{x^2-3x+2}$

$\frac{(x-1)(x-1)}{7(x-1)} \cdot \frac{21^{3}}{(x-2)(x-1)}$

$\frac{3}{(x-2)}$

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9) $\frac{64-x^2}{3x^2+x} \cdot \frac{3x}{x^2-64}$

$\frac{-(x^2-64)}{x(3x+1)} \cdot \frac{3x}{(x-8)(x+8)}$

$\frac{-(x+8)(x-8)}{x(3x+1)} \cdot \frac{3x}{(x-8)(x+8)} = \frac{-3}{3x+1}$

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4) $\frac{x^2-5x}{x^2-4} \cdot \frac{3x+6}{x^3-5x^2}$

$\frac{x(x-5)}{(x-2)(x+2)} \cdot \frac{3(x+2)}{x^2(x-5)} = \frac{3}{x(x-2)}$

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## *DIVIDING RATIONAL EXPRESSIONS*

Divide: 1) $\frac{3}{5} \div \frac{7}{2} = \frac{3}{5} \cdot \frac{2}{7} = \frac{6}{35}$

2) $\frac{3}{5} \div \frac{4}{10} = \frac{3}{1} \cdot \frac{2}{4} = \frac{6}{4} = \frac{3}{2}$

Both rational numbers and rational expressions are divided the same way:

$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{ad}{bc}$ where $b, c, \text{and } d \neq 0$

Never mind the reason why, just . . .

Example 1: $\frac{5x}{4y} \div \frac{2x}{3y^2} = \frac{5x}{4y} \cdot \frac{3y^2}{2x} = \frac{15y}{8}$

Example 2: $\frac{x}{x+3} \div \frac{2x}{(x+2)(x+3)} = \frac{x}{x+3} \cdot \frac{(x+2)(x+3)}{2x} = \frac{(x+2)}{2}$

Example 3: $\frac{x^2-4}{x+3} \div \frac{x^2-4x+4}{x^2+3x} = \frac{x^2-4}{x+3} \cdot \frac{x^2+3x}{x^2-4x+4} = \frac{(x+2)(x-2)}{x+3} \cdot \frac{x(x+3)}{(x-2)(x-2)} = \frac{x(x+2)}{(x-2)}$

Example 4: $\frac{\frac{x^2-4}{2}}{\frac{2-x}{4}} \quad \frac{x^2-4}{2} \div \frac{2-x}{4} = \frac{x^2-4}{2} \cdot \frac{4}{2-x}$

$\frac{2(x+2)}{-1} = -2(x+2) \quad \frac{(x-2)(x+2)}{2} \cdot \frac{4}{-1(x-2)}$

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